Noise Figure and Phase Noise Analyzers

CATALOG





KEYSIGHT

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Keysight Noise Figure and Phase Noise Analyzers

One family. 3 classes.



NOISE FIGURE ANALYZERS

NF7-class

- 3.6 GHz to 40 GHz
  Maximum frequency
- ±0.15 dB Gain uncertainty



PHASE NOISE ANALYZERS

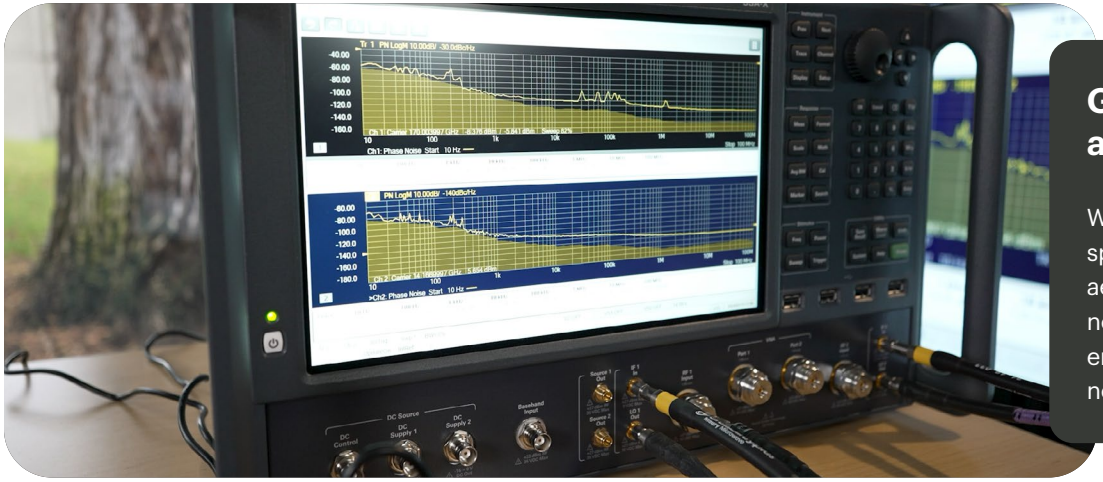
PN3, PN7-class

- 7 GHz to 54 GHz
  Maximum frequency
- 100 MHz to 8 GHz
  Maximum offset frequency

Introduction

Keysight Noise Figure and Phase Noise Analyzers — RF characterization from R&D to manufacturing

Keysight noise figure and phase noise analyzers are now offered in three capability classes designed to characterize and optimize the performance of RF components and systems — whether you are in the lab or on the production floor. Noise figure analyzers include the NF7-class, providing accurate and repeatable noise figure measurements. Phase noise analyzers include the PN3- and PN7-class, designed for precise characterization of low-level signals. With multiple classes to choose from, understanding which analyzer best suits your application is key to making informed decisions to unlock the full potential of your instrument. A comprehensive library of noise figure and phase noise analyzer resources is available to help you find the class best suited to your lab.

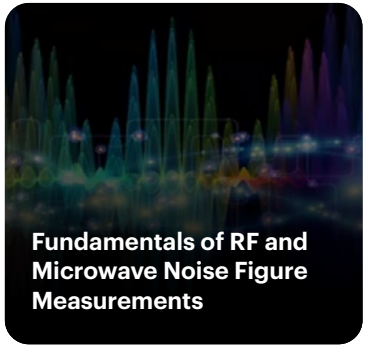


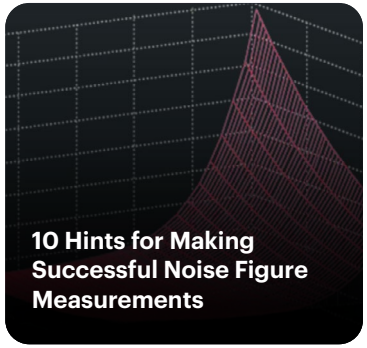
Get better insights with repeatable and accurate results

Whether you are working on general-purpose or industry-specific applications, such as wireless, automotive, or aerospace and defense, you need accurate and repeatable noise measurements. Keysight resources cover basic and enhanced applications to help you fully use the capabilities of noise figure and phase noise analyzers.

Here are a few examples of the resources you will find to help you select the noise figure and phase noise analyzer that is right for you:







Noise Figure Analyzers

Fast, accurate noise figure measurements

Keysight NF7-class noise figure analyzers include the N8973B-N8976B noise figure analyzers. They are designed to make fast, accurate, and repeatable noise figure measurements. When combined with our signal noise source (SNS) and the included USB preamplifier, the noise figure analyzer automatically downloads excess noise ratio (ENR) data, streamlining the measurement process. Our noise figure analyzers are easy to use with a multi-touch interface that enables stretch, pinch, and drag gestures. Choose one of our popular configurations or configure one specific to your application.

Learn more about our noise figure analyzers

Low instrument uncertainty

Designed to minimize internal circuitry errors, the low instrument uncertainty of ±0.02 dB ensures accurate, repeatable noise figure measurements.

Automated calibration

Streamlines Y-factor measurements by enabling automated calibration of up to 12 device-under-test (DUT) setups in a single step, significantly reducing test time.

Multimode signal analysis

Provides additional modes such as spectrum analyzer and IQ analyzer, enabling diverse signal analysis tasks within a single instrument.

Built-in uncertainty calculator

Computes noise figure uncertainty by auto-populating data from the SNS, USB preamplifier, and key instrument parameters like analyzer noise figure and match.



Maximum frequency	**3.6 GHz to 40 GHz**
Gain uncertainty	**±0.15 dB**
Instrument uncertainty	**±0.02 dB using a 4 – 6 dB ENR noise source**
Bandwidth	**8 MHz**

View popular configuration

Phase Noise Analyzers

High-sensitivity phase noise measurements

Keysight phase noise analyzers come in two classes. The PN3-class includes the E5045A-E5047A signal source analyzers, and the PN7-class includes the E5055A-E5058A signal source analyzers and the N5511A phase noise test system. They deliver accurate, high-sensitivity measurements to detect the lowest levels of phase noise and spurious signals. Enhanced cross-correlation methodology suppresses internal noise and ensures accurate, repeatable results — especially when measuring sources with minimal phase noise. Our high-end models enable ultra-sensitive measurements, with readings down to the kT thermal noise floor (-177 dBm/Hz), ensuring precise characterization of the lowest possible signal levels. Choose one of our popular configurations or configure one specific to your application.

Learn more about our phase noise analyzers

High measurement sensitivity

Detects low-level phase noise and spurious signals with high sensitivity, enabling precise characterization of signal sources and reliable performance of DUTs.

Cross-correlation method

Uses dual independent channels to actively suppress internal noise through cross-correlation, enabling precise and reliable measurement of signal sources with minimal phase noise.

Dedicated phase noise analysis

Purpose-built to accurately measure absolute and residual (additive) phase noise of both pulsed and non-pulsed signals, enabling comprehensive evaluation of overall system and component-level performance.

AM / baseband performance

Measures amplitude modulation (AM) and baseband noise, both of which can degrade error vector magnitude (EVM) in digitally modulated signals and contribute to overall phase noise performance.

Class	Included Brands	Range of Performance Specifications			
		Maximum Frequency	Maximum Offset Frequency	Absolute Phase Noise Sensitivity (10 GHz @ 10 kHz offset, Xcorr=1)	Residual Phase Noise Sensitivity (10 GHz @ 10 kHz offset, Xcorr=1)
PN3	E5045A-E5047A	7 GHz to 40 GHz	100 MHz	-135 dBc/Hz to -138 dBc/Hz	-150 dBc/Hz
PN7	E5055A-E5058A and N5511A	5 MHz to 30 MHz	160 MHz to > 8 GHz	-149 dBc/Hz to -153 dBc/Hz	-156 dBc/Hz to -187 dBc/Hz

View popular configurations

Software and Accessories

Find compatible software and accessories for your phase noise analyzer

Keysight phase noise analyzer software enhances signal analysis with enhanced features like user-defined cross-correlation, transient and voltage-controlled oscillator (VCO) characterization, and spectrum monitoring. Additional capabilities enabled by software include full-span spurious searches, pulsed-RF noise analysis with 100 ns resolution, and ultra-precise clock jitter analysis. Our phase noise analyzer software provides you with powerful insights, faster spurious detection, and highly accurate characterization of RF and clock signals. Pair your phase noise analyzer with the mixers or downconverters needed to make the right measurements for your application.



Power your your phase noise analyzer with a wide range of software, including:

- phase noise analysis
- spectrum analysis
- pulsed-RF measurements
- precision clock jitter analysis

Explore software



Get more functionality out of your phase noise analyzer by pairing it with the right accessories, including:

- waveguide harmonic mixer
- microwave downconverter
- flange kit

Explore accessories

Keysight Support Services

Explore the services that are right for you

Keysight Support Services can reduce your learning curve, enhance your uptime, guarantee the accuracy of your testing equipment, and provide the expertise you require, precisely when and where you need it.

Maximize your instrument uptime, quickly optimize your test measurements, and get the answers you need at our fastest available times. KeysightCare curated support plans bundle critical services with prioritized response and turnaround times. **High-performance instruments include one year of KeysightCare Assured.**

Explore support services



Calibration

Ensure your test system performs to specification and meets local and global standards.



Repair

Restore equipment to original functionality and specifications with trained technicians.



KeysightCare

Innovate at speed with curated support plans and prioritized response and turnaround times.



Education

Make measurements quickly with eLearning and in-house, instructor-led training.



Keysight Support

Get 24x7 access to service requests, case management help, and technical articles.

Keysight enables innovators to push the boundaries of engineering by quickly solving design, emulation, and test challenges to create the best product experiences. Start your innovation journey at www.keysight.com.

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